

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

ECOLOGICAL SITE DESCRIPTION



Texas and Oklahoma Panhandle (MLRA 77E)

ECOLOGICAL SITE CHARACTERISTICS

Site Type: Rangeland

Site Name: Breaks (slopes $\geq 20\%$)

Site ID: R077EY005TX, (Formerly O78XY005OK Oklahoma)

Precipitation or Climate Zone: Annual Precipitation 16 – 24 inches

Oklahoma Counties: Beaver, Cimarron, Ellis, Harper, Texas, Woodward

Original Site Description Approval:

Oklahoma: 8/1/1960
Author: Unknown

Texas: 11/2001
Author: J.R. Bell

Revisions:

Date: 12/2002
Author: J.R. Bell

Technical Editors: Mark Moseley, State Range Conservationist, NRCS
Dr. Jack Eckroat, Grazing Lands Specialist, NRCS

Physiographic Features:

Narrative: This site is classified as upland. It occurs as steep escarpments and talus slopes located where the flat portions of the high plains mantle and the major drainages that incise the plains join. These breaks can occur as abrupt, nearly vertical canyon walls, or as more rounded steep hills with talus slopes below. Geologically speaking, these are the advancing erosion fronts that are very slowly working their way into the flat plains.

Land Form:	(1) escarpments
	(2) scarp slopes
Aspect:	(1) north and east exposure
	(2) south and west exposure

	Minimum	Maximum
Elevation (feet):	2400	4200
Slope (percent):	12	30
Water Table Depth (inches):	N/A	N/A
Flooding:	N/A	N/A
Frequency:	N/A	N/A
Duration:	N/A	N/A
Ponding:	N/A	N/A
Depth (inches):	N/A	N/A
Frequency:	N/A	N/A
Duration:	N/A	N/A
Runoff Class:	Rapid	Rapid

Climatic Features:

Narrative: The climate is semiarid continental. Summers are hot with winters generally being mild. Temperature extremes are common. Humidity is generally low, and short-term droughts are common. Winds speeds average 12 mph and are highest in early spring. The prevailing wind direction is southwest. In the fall and winter, northers are common with severe temperature drops. Cold spells do not generally last more than a few days.

Most of the precipitation occurs from May to September. Rainfall events often occur as intense showers of relatively short duration. Snowfall average is about 14 inches. Long term droughts are likely to occur every 20 to 25 years and may last 4 to 5 years.

Growing season averages 195 days. Average first frost is around October 25, and the last freeze of the season usually occurs around April 1.

	Minimum	Maximum
Frost-free period (days):	195	210
Freeze-free period (days):	190	200
Mean annual precipitation (inches):	16	21
Mean annual temperature (°F)	54	62
Mean annual soil temperature (°F)	58	61

Monthly moisture and temperature distribution:

Month	Mean precipitation (in)	Percent precipitation (%)	Avg. Daily Maximum Temp (°F)	Avg. Daily Minimum Temp (°F)	Mean Temp (°F)
January	0.45	2.4	50.3	22.7	37.0
February	0.63	3.3	55.7	26.9	41.3
March	1.10	5.9	64.2	34.3	49.3
April	1.20	6.4	73.8	43.9	58.8
May	2.90	15.5	81.4	53.1	67.2
June	3.10	16.6	88.9	62.1	75.5
July	2.90	16.0	91.7	66.5	79.1
August	2.20	11.8	89.4	64.7	77.0
September	1.68	9.1	82.6	57.6	70.1
October	1.15	6.1	74.0	46.0	60.0
November	0.75	4.0	61.5	34.3	47.9
December	0.54	2.9	51.8	25.4	39.0
Mean annual	18.60	100.0	72.0	44.8	58.5

Climate Stations:			
Station ID	Location	From	To
(1) TX 8523	Spearman, TX	1920	1999
(2) TX 3787	Gruver, TX	1941	1999
(3) TX8692	Stratford, TX	1941	1999

Influencing Water Features:

Narratives:

Non-stream characteristics: Overland flow from the flat lands above move across and down this site to the major streams below.

Stream characteristics: The site exists as a result of the formation of drainage patterns of major streams. The streams are generally located some distance below this site on the landscape.

Representative Soil Features:

Narrative: Soil formation is limited due to slope and geologic erosion. The exposed sediments are of upper Ogallala and High Plains origins. The caprock caliche that is exposed at the extreme upper portion of the site has its origin as leached carbonates, but these have been incised and exposed, therefore becoming extremely hard due to weathering. The loose sediments consist of gravelly, loamy and rocky material. In many places, the hard caliche has broken away from the upper escarpment and tumbled down slope as talus. The Breaks site must occur on slopes of 20% or more.

Parent Materials:	
Kind:	Upper Ogallala sediments and leached carbonates
Origin:	Upper Ogallala formation (leached carbonates of aeolian origin)
Surface Texture:	(1) Loams & gravelly loams mixed with coarse fragments
	(2)
	(3)
Surface Texture Modifier:	(1) gravelly
	(2) stony
Subsurface Texture Group:	loams, gravelly loams with many coarse fragments
Surface Fragments ≤ 3" (% cover):	25 – 40%
Surface Fragments >3" (% cover):	25 – 40%
Subsurface Fragments ≤ 3" (% Volume):	30% or >
Subsurface Fragments > 3" (% Volume):	30% or >

	Minimum	Maximum
Drainage Class:	Well-drained	Well-drained
Permeability Class:	Moderately	Moderately
Depth (inches):	2	10
Electrical Conductivity (mmhos/cm):	<2 mmhos/cm	<2 mmhos/cm
Sodium Adsorption Ratio:	-	-
Calcium Carbonate Equivalent (percent):	40	70
Soil Reaction (1:1 Water):	8.0	8.4
Soil Reaction (0.1M CaCl₂):	-	-
Available Water Capacity (inches):	.4	.8

Representative Soils: Representative soils include Berda, Mansic, Mobeetie, and Oklark.

Plant Communities: Ecological Dynamics of the Site

Narrative: The presumed historic plant community (HPC) is a mixture of grasses, forbs, shrubs, and a few trees. Vegetative cover is generally sparse. Soil depth and slope limits plant density. Percent bare ground is high. There are many rocks and cobbles on the surface. The mixed nature of the sediments contributes to a wide variety of species. The plant community varies greatly within the site depending on exposure and the amount of soil material present. Generally, the north and east facing exposures have a greater variety of plants present and a slightly higher vegetative production due to more mesic conditions. Productivity is generally low and palatability of forage is less than sites with deeper soil resources. Accessibility is limited due to steep slopes. Tall, mid, and shortgrass species are found on the site along with several species of forbs and shrubs. Little bluestem and sideoats grama are often the most common grasses, however, other grasses such as hairy grama, blue grama, perennial threeawn, sand bluestem, and Indiangrass are also found. The more common shrubs are feather dalea, skunkbush sumac, and Juniper. Plains greasebush and mountain mahogany are found in lesser amounts. Juniper may not be present on all sites due to the lack of a seed source.

Areas occur within the site where shrubs may be quite prominent and make up a relatively large percent of the total biomass. This site is not a preferred grazing area for most domestic livestock due to accessibility and shallow soils. This site is usually not heavily grazed. Browsing wildlife species such as white-tailed deer and mule deer frequent the site

because of the wide variety of food providing forbs and shrubs, and for the cover provided by the canyons, shrubs and trees.

Natural fire played a role in the ecology of the site as is true for practically all of the high plains sites. The general effects of fire were to promote grasslands and suppress woody shrubs. However, the rocky soils and steep terrain of this site have much more influence on the plant community than does any external ecological influence. The sparse vegetation and lower production probably affected fire continuity, and the lack of heat generated by natural fire may have limited the degree of damage to woody plants. In general, when burned periodically, the tallgrasses tend to benefit and shrubs are suppressed for a few years. Non-sprouting juniper types are especially suppressed by fire. Some of the steeper slopes and canyon walls escape fire altogether. It takes this site longer to recover from a burn than most associated sites due to sparse plant density and dry soils.

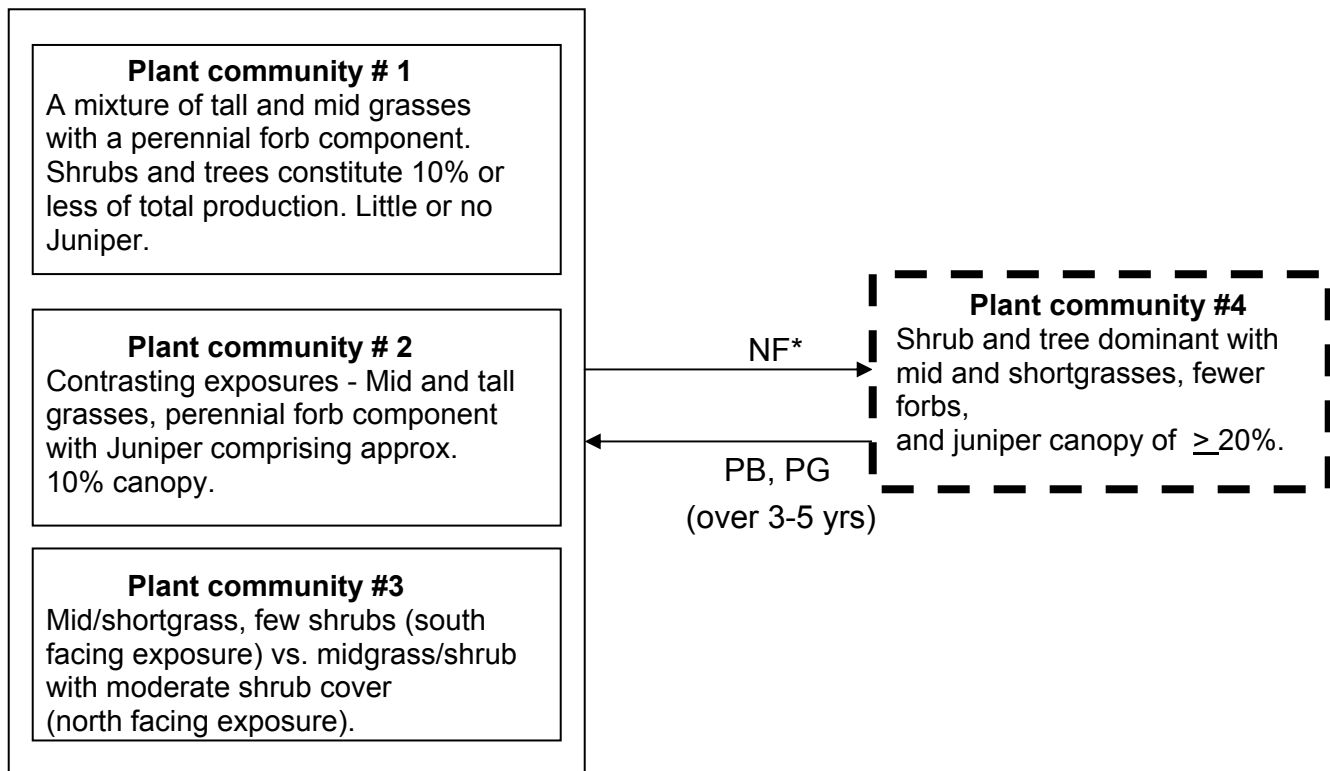
Since this site is not normally heavily grazed, the overall ecological condition tends to be not affected by animal use. There are places where, on the most accessible part of the site, there is evidence of grazing by cattle. The grazing tends to be seasonal and for shorter durations than on more productive, less-sloping terrain. If the site were grazed by goats instead of cattle, then overgrazing via browsing could be more of a potential problem. This can be observed in other areas of the country where cattle are not the principal grazers. Deer utilize this site readily, but in most places, the deer population is not dense enough to place much pressure on the primary browse.

Geologic erosion usually occurs on this site. In most cases, this site is more important for wildlife habitat than for livestock grazing. A diverse plant community benefits the animal species utilizing this site as well as promoting natural ecological processes.

State and Transition Diagram:

The following diagram suggests some pathways that the vegetation on this site might take. There may be other states not shown on the diagram. This information is intended to show what might happen in a given set of circumstances; it does not mean that this would happen the same way in every instance. Local professional guidance should always be sought before pursuing a treatment scenario.

Variants of presumed historic plant community (HPC):



Note: Increases in Juniper will not be due to grazing pressure, but rather to a seed source being available in wildlife droppings with no fire acting as a suppressing force.

Legend:

- NF*** - no natural fire for 25+ yrs and Juniper seed source available
- PG** - prescribed grazing
- PB** - prescribed burning

Threshold - 

Changes in structure and makeup of the Breaks plant community may be due to management, natural occurrences, or both. As these changes occur, at some point in time, thresholds may be crossed. This means that once ecological site changes have progressed beyond a certain point (threshold), the community has been altered to the extent that a return to a former state is not possible without external intervention that requires significant

energy input. These changes take place on all ecological sites, but some sites support communities that are more resistant to change than others. Changes in management practices alone, such as grazing techniques, will not be sufficient to restore former plant communities once a threshold has been crossed. An example of significant energy input might be the implementation of chemical brush management to decrease the amount of woody shrubs and increase the amount of grasses and forbs. The amount of energy required to bring about a change in a plant community balance may vary a great deal depending on the present state and upon the desired result.

Absence of fire will often result in a decrease in the amount of tallgrasses and an increase in shrubs over time. This may take considerable time to occur, perhaps several decades. If fire can be reintroduced as a management tool, the shrubs, especially juniper, can be reduced, and a more balanced plant community may be restored. This may take 3 to 5 years to accomplish. Generally, the steep terrain and shallow soils of the Breaks site restrict the use of management practices that accelerate the manipulation of plant communities. Effective, practical grazing management and the occasional use of fire are likely to be the most practical and effective treatments. There might be occasions when the treatment of juniper by herbicide or hand-cutting may be used when the increase in canopy cover is unacceptable.

It should be mentioned that woody plant species are desirable if the site is to be managed for deer habitat. Mule deer do not require much cover, but prefer to have some woodies present for browse, shade and bedding. White-tailed deer prefer more total cover and interspersed mosaic shrub and tree cover. Prescribed fire should be necessary no more than once every 10 - 12 years to suppress woody plants such as juniper.

Plant Community Name: Breaks, Presumed HPC. Mixture of tall, mid and short grasses, forbs and a few shrubs and trees.



Photo Plant Community Number: Breaks, Aspect 1

Narrative: The interpretive plant community for this site is the presumed HPC community. It is difficult to describe the exact community since the amount of actual soil material present, the degree of slope, and the exposure is variable. All of these factors influence the plant community. Tallgrasses, such as sand bluestem and Indiangrass, usually occur in crevices or in small areas of greater soil depth. A moderate amount of forbs are usually present and are usually well distributed. Shrubs make up approximately 5 - 10% of the production, but may be localized in occurrence. This community is very stable and shifts little from year to year. This community is common in the Oklahoma panhandle and northern Texas panhandle along the drainages of Coldwater Creek, Palo Duro Creek, Beaver River, Wolf Creek and the rougher terrain along the South Canadian River.

This plant community is dominated by little bluestem and sideoats grama along with smaller amounts of sand bluestem and a variety of shorter grasses. The main forbs include plains actinea, dotted gayfeather, plains blackfoot, perennial wild buckwheat, and halfshrub sundrop. The major shrubs are skunkbush sumac, yucca, broom snakeweed and feather dalea. This site has been subjected to at least one natural fire in the last 20 years. Production is very good for this site. The taller grass species are located where slightly more soil material has accumulated and more moisture is available. The shrub and tree component depicted in this particular photo is less than other locations. There are no junipers on this site, but there were scattered junipers on similar sites nearby.

Annual Production by Plant Type: Air Dry Weight, pounds per acre

Plant Type	Low	RV	High
Grasses /Grasslike	515	740	965
Forb	65	95	120
Shrub/Vine	40	60	70
Tree	15	20	30
Lichen	T	T	T
Moss	T	T	T
Microbiotic Crusts	10	15	15
Total	645	930	1200

Plant Species Composition:

Grasses and Grasslikes (740 pounds per acre)

Group	Common Name	Scientific Name	Annual Production
1	sideoats grama	<i>Bouteloua curtipendula</i>	400
1	little bluestem	<i>Schizachyrium scoparium</i>	
2	hairy grama	<i>Bouteloua hirsute</i>	260
2	blue grama	<i>Bouteloua gracilis</i>	
2	slim tridens	<i>Tridens muticus</i>	
2	sand dropseed	<i>Sporobolus cryptandrus</i>	
2	silver beardgrass	<i>Bothriochloa laguroides</i>	
2	purple threeawn	<i>Aristida purpurea</i>	
2	fall witchgrass	<i>Digitaria cognata</i>	
3	Indiangrass	<i>Sorghastrum nutans</i>	80
3	sand bluestem	<i>Andropogon hallii</i>	

Forbs (95 pounds per acre)

Group	Common Name	Scientific Name	Annual Production
4	half-shrub sundrop	<i>Oenothera albicaulis</i>	95
4	stemmy four-nerve daisy	<i>Tetraneuris scaposa</i>	
4	black samson	<i>Echinacea angustifolia</i>	
4	dotted gayfeather	<i>Liatris punctata</i>	
4	plains blackfoot	<i>Melampodium leucanthum</i>	
4	Fendler's penstemon	<i>Penstemon fendleri</i>	
4	longleaf buckwheat	<i>Eriogonum</i> spp.	
4	slimflower scurfpea	<i>Psoralea tenuiflora</i>	
4	primrose sp.	<i>Oenothera</i> spp.	
4	sand lily	<i>Mentzelia strictissima</i>	
4	yellow nailwort	<i>Paronychia virginica</i>	
4	hoary blackfoot	<i>Melampodium cinereum</i>	
4	purple loco	<i>Oxytropis lambertii</i>	
4	chalk hill hymenopappus	<i>Hymenopappus tenuifolius</i>	
4	annual forbs		
4	Louisiana sagewort	<i>Artemisia ludoviciana</i>	
4	baby-white aster	<i>Chaetopappa ericoides</i>	
4	trailing ratany	<i>Krameria lanceolata</i>	
4	Gordon's bladderpod	<i>Lesquerella gordonii</i>	
4	prairie bluets	<i>Hedyotis nigricans</i>	
4	branched noseburn	<i>Tragia ramosa</i>	
4	white milkwort	<i>Polygala alba</i>	
4	Jame's rushpea	<i>Hoffmannseggia glauca</i>	
4	stiffleaf false goldaster	<i>Heterotheca stenophylla</i>	
4	shaggy dwarf morning glory	<i>Evolvulus nuttallianus</i>	

Shrubs (80 pounds per acre)

Group	Common Name	Scientific Name	Annual Production
5	catclaw mimosa	<i>Mimosa acutleaticarpa</i>	60
5	yucca	<i>Yucca glauca</i>	
5	mountain mahogany	<i>Cercocarpus montanus</i>	
5	feather Dalea	<i>Dalea formosa</i>	
5	skunkbush sumac	<i>Rhus trilobata</i>	
5	plains greasebush	<i>Glossopetalon planitierum</i>	
5	broom snakeweed	<i>Gutierrezia sarothrae</i>	
5	ephedra	<i>Ephedra antisyphilitica</i>	
5	plains pricklypear	<i>Opuntia polyacantha</i>	

Trees (20 pounds per acre)

Group	Common Name	Scientific Name	Annual Production
6	hackberry	<i>Celtis occidentalis</i>	20
6	one-seeded juniper	<i>Juniperus monosperma</i>	

Structure and Cover:

Soil Surface Cover

Basal Cover				Non-Vascular Plants	Biological Crust	Litter	Surface Fragments >1/4 & <= 3"	Surface Fragments > 3"	Bedrock	Water	Bare Ground
Grass/ Grasslike	Forb	Shrub/ Vine	Tree								

Ground Cover

Vegetative Cover						Non-Vegetative Cover					
Grass/ Grasslike	Forb	Shrub/ Vine	Tree	Non-Vascular Plants	Biological Crust	Litter	Surface Fragments >1/4 & <= 3"	Surface Fragments > 3"	Bedrock	Water	Bare Ground

Structure of Canopy Cover:

	Grass/Grasslike	Forb	Shrub/Vine	Tree
<= 0.5 feet				
>0.5 - <=1 feet				
>1 - <=2 feet				
>2 - <=4.5 feet				
>4.5 - <=13 feet				
>13 - <= 40 feet				
>40 - <=80 feet				
>80 - <= 120 feet				
>120 feet				

Growth Curve Number: OK0001

Growth Curve Name: Native – Panhandle

Growth Curve Description: Presumed HPC: Warm season tall and midgrasses, forbs, and shrubs.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	7	9	12	24	18	14	4	5	4	3	0

Plant Community Name: Breaks, HPC, Midgrasses, tallgrasses, forbs and trees



Photo Plant Community: Breaks, Aspect 2

Narrative: This site contains little bluestem, other tallgrasses, yucca, skunkbush sumac and has approximately 10% juniper species canopy cover. Juniper has a tendency to increase with the absence of fire provided a seed source is available. This site is located in northern Hansford Co., Texas, near the Palo Duro Reservoir. This Breaks site has not been grazed for several years. The juniper here is a blue berry species, thought to be *Juniperous monosperma*.

Ground cover and structure: Annual Production in lbs. per acre

Plant Type	Low	RV	High
Grass/Grasslike	400	600	740
Forbs	40	60	90
Shrub/Vine	30	35	45
Tree	50	70	120
Lichen	T	T	T
Moss	T	T	T
Microbiotic Crusts	0	5	5
Total	520	770	1000

Growth curve number: OK0001

Growth curve name: Native, Panhandle midgrass, tallgrass, shrubs, and trees

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	7	9	12	24	18	14	4	5	4	3	0

Plant Community Name: Breaks, HPC, Contrasting exposures



Photo Plant Community Number: Breaks, Aspect 3

Narrative: South and southwest exposures differ from north and northeast exposures. This difference is expressed in the plant communities that develop on each exposure. The more mesic north and northeast exposures tend to have more diversity and more tallgrasses and shrubs than do the south and southwest exposures. This photograph shows both exposures on the same site. The plant community is short and midgrass/shrub on the south exposure and midgrass/shrub on the north exposure.

Sites in the background are different exposures of the Breaks Site. Hairy grama and Wright's threeawn are the dominant grasses along with small amounts of sideoats grama on the left (south facing slope). Few shrubs are present. In contrast, the north facing slope (on the right side of the photograph) has a large amount of little bluestem and a much stronger shrub component (mainly skunkbush sumac). Less exposure to sunlight and the drying effects of the southwest winds are probably the main factors for this difference.

Ground Cover and Structure: Annual Production (lbs. per Acre)

Plant Type	Low	RV	High
Grass/grasslikes	450	575	655
Forbs	50	75	95
Shrubs/Trees	20	40	60
Microbiotic crust	0	10	15
Lichen/Moss	T	T	T
Total	520	700	825

Growth Curve Number: OK0001

Growth Curve Name: Native - Panhandle

Growth Curve Description: Breaks, Midgrasses and shrubs

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
0	7	9	12	24	18	14	4	5	4	3	0

Ecological Site Interpretations:

Animal Community: The Breaks site is used by mule deer and white-tailed deer for cover and browsing. The canyons offer good bedding places and protection from weather.

Small mammals and predators also frequent the site. Golden eagles and large hawks often build nests in the clefts of the escarpments. Many species of songbirds utilize this site, especially if a juniper community is present. Cattle seasonally graze the more accessible parts of this site, but they graze these accessible Breaks areas with less frequency than associated sites.

Plant Preferences by Animal Kind: This rating system provides general guidance as to animal preference for plant species. It also reveals possible competition between kinds of herbivores for various plants. Grazing preference changes from time to time, especially between seasons, and between animal kinds and classes. Grazing preference does not necessarily reflect the ecological status of the plant within the plant community.

Animal Kind: Cattle

Common Name	Scientific Name	Plant Part	Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
sideoats grama	<i>Bouteloua curtipendula</i>	Leaves	P	P	P	P	P	P	P	P	P	P	P	P
little bluestem	<i>Schizachyrium scoparium</i>	Leaves	D	D	D	D	P	P	P	D	D	D	D	D
hairy grama	<i>Bouteloua hirsuta</i>	Leaves	U	U	U	D	D	D	D	D	D	D	U	U
blue grama	<i>Bouteloua gracilis</i>	Leaves	P	P	P	P	P	P	P	P	P	P	P	P
slim tridens	<i>Tridens mutica</i>	Leaves	D	D	D	D	D	D	D	D	D	D	D	D
sand dropseed	<i>Sporobolus cryptandrus</i>	Leaves	D	D	D	D	D	D	D	D	D	D	D	D
perennial threeawn	<i>Aristida wrightii</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
fall witchgrass	<i>Leptoloma cognatum</i>	Leaves	D	D	D	D	U	U	U	U	U	U	D	D
silver bluestem	<i>Bothriochloa saccharoides</i>	Leaves	D	D	D	D	D	D	D	D	D	D	D	D
Indiangrass	<i>Sorghastrum nutans</i>	Leaves	P	P	P	P	P	P	P	P	P	P	P	P
sand bluestem	<i>Andropogon gerardii</i>	Leaves	D	D	D	P	P	P	P	P	P	P	D	D
half-shrub sundrop	<i>Calylophus serulatus</i>	Leaves	-	-	-	D	D	D	D	D	D	D	D	-
plains actinea	<i>Tetrameura scaposa</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
black samson	<i>Echinacea angustifolia</i>	Leaves	-	-	-	D	D	D	U	U	U	U	-	-
dotted gayfeather	<i>Liatris punctata</i>	Leaves	-	-	-	U	U	U	U	U	U	U	-	-
plains blackfoot	<i>Melampodium leucanthum</i>	Leaves	-	-	-	U	U	U	U	U	U	U	-	-
catclaw sensitivebriar	<i>Schrankia uncinata</i>	Leaves	-	-	-	D	D	D	D	D	D	-	-	-
longleaf buckwheat	<i>Eriogonum</i> sp.	Leaves	-	-	-	U	U	U	U	U	U	-	-	-
slimflower scurfpea	<i>Psoralea tenuiflora</i>	Leaves	-	-	-	D	D	D	D	U	U	-	-	-
primrose sp.	<i>Onagraceae</i> sp.	Leaves	-	-	-	D	D	D	D	D	D	-	-	-
sand lily	<i>Mentzelia strictissima</i>	Leaves	-	-	-	U	U	U	U	U	U	-	-	-
yellow nailwort	<i>Paronychia virginica</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
hoary blackfoot	<i>Melampodium cinereum</i>	Leaves	-	-	-	U	U	U	U	U	U	-	-	-
purple loco	<i>Oxytropis lambertii</i>	Leaves	-	-	-	U	U	U	U	U	U	-	-	-
chalkhill woollywhite	<i>Hymenopappus flavescens</i>	Leaves	-	-	-	D	D	U	U	U	U	U	-	-
annual forbs	AAFF	Leaves	-	-	-	D	D	D	D	U	U	-	-	-
catclaw mimosa	<i>Mimosa acutleaticarpa</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
yucca	<i>Yucca glauca</i>	Flowers	U	U	U	U	D	D	U	U	U	U	U	U
mountain mahogany	<i>Cercocarpus montanus</i>	Leaf/Stem	U	U	U	U	D	D	D	U	U	U	U	U
feather Dalea	<i>Dalea Formosa</i>	Leaf/Stem	U	U	U	U	U	U	U	U	U	U	U	U
skunkbush sumac	<i>Rhus aromatica</i>	Leaf/Stem	U	U	U	U	U	U	U	U	U	U	U	U
plains greaseweed	<i>Forsellesia planitierum</i>	Leaf/Stem	U	U	U	U	U	U	U	U	U	U	U	U
broomsnakeweed	<i>Gutierrezia sarothrae</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
ephedra	<i>Ephedra antisyphilitica</i>	Stems	D	D	D	D	D	D	D	D	D	D	D	D
hackberry	<i>Celtis reticulata</i>	Leaf/Stem	U	U	U	U	D	D	D	D	D	U	U	U
juniper	<i>Juniperus monosperma</i>	Leaf/Stem	U	U	U	U	U	U	U	U	U	U	U	U

Legend: P = Preferred D = Desirable U = Undesirable E = Emergency N = Nonconsumed T = Toxic

Animal Kind: Deer

Common Name	Scientific Name	Plant Part	Preferences											
			J	F	M	A	M	J	J	A	S	O	N	D
sideoats grama	<i>Bouteloua curtipendula</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
little bluestem	<i>Schizachyrium scoparium</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
hairy grama	<i>Bouteloua hirsuta</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
blue grama	<i>Bouteloua gracilis</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
slim tridens	<i>Tridens mutica</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
sand dropseed	<i>Sporobolus cryptandrus</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
Wright's threeawn	<i>Aristida wrightii</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
fall witchgrass	<i>Leptoloma cognatum</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
silver bluestem	<i>Bothriochloa saccharoides</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
Indiangrass	<i>Sorghastrum nutans</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
sand bluestem	<i>Andropogon hallii</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
half-shrub sundrop	<i>Calylophus serulatus</i>	Leaves	-	-	-	P	P	P	P	P	P	P	D	-
plains actinea	<i>Tetraneuris scaposa</i>	Leaves	U	U	U	D	D	U	U	U	U	U	U	U
black samson	<i>Echinacea angustifolia</i>	Leaves	-	-	-	D	D	D	U	U	U	U	-	-
dotted gayfeather	<i>Liatris punctata</i>	Leaves	-	-	-	D	D	D	U	U	U	U	-	-
plains blackfoot	<i>Melampodium leucanthum</i>	Leaves	-	-	-	D	D	U	U	U	U	U	-	-
catclaw sensitivebriar	<i>Schrankia uncinata</i>	Leaves	-	-	-	D	D	D	D	D	D	U	-	-
longleaf buckwheat	<i>Eriogonum</i> sp.	Leaves	-	-	-	U	U	U	U	U	U	U	-	-
slim flower scurfpea	<i>Psoralea tenuiflora</i>	Leaves	-	-	-	D	D	D	D	D	D	U	-	-
primrose sp.	<i>Onagraceae</i> sp.	Leaves	-	-	-	P	P	P	P	D	D	D	-	-
mentzelia	<i>Mentzelia strictissima</i>	Leaves	-	-	-	D	D	D	U	U	U	U	-	-
broom nailwort	<i>Paronychia virginica</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
hoary blackfoot	<i>Melampodium cinereum</i>	Leaves	-	-	-	D	D	D	D	U	U	U	-	-
purple loco	<i>Oxytropis lambertii</i>	Leaves	-	-	-	U	U	U	U	U	U	U	-	-
chalkhill woolly white	<i>Hymenopappus flavescens</i>	Leaves	-	-	-	D	D	D	D	D	D	D	-	-
annual forbs		Leaves	P	P	P	P	P	P	P	P	P	P	P	P
catclaw mimosa	<i>Mimosa acutileticarpa</i>	Leaves	U	U	U	D	D	D	U	U	U	U	U	U
yucca	<i>Yucca glauca</i>	Flowers	C	C	C	D	D	D	C	C	C	C	C	C
mountain mahogany	<i>Cercocarpus montanus</i>	Leaf/Stem	U	U	U	P	P	P	P	P	P	U	U	U
feather Dalea	<i>Dalea formosa</i>	Leaf/Stem	U	U	U	D	D	D	D	D	D	U	U	U
skunkbush sumac	<i>Rhus aromatica</i>	Leaf/Stem	C	C	C	D	D	D	D	D	D	C	C	C
plains greasebush	<i>Forsellesia planitierum</i>	Leaf/Stem	U	U	U	P	P	P	D	D	D	U	U	U
broom snakeweed	<i>Gutierrezia sarothrae</i>	Leaves	U	U	U	U	U	U	U	U	U	U	U	U
ephedra	<i>Ephedra antisiphilitica</i>	Stems	D	D	D	D	D	D	D	D	D	D	D	D
hackberry	<i>Celtis reticulata</i>	Leaf/Stem	U	U	U	P	P	P	P	P	P	U	U	U
one-seeded juniper	<i>Juniperus monosperma</i>	Leaf/Stem	C	C	C	C	C	C	C	C	C	C	C	C
			U	U	U	U	U	U	U	U	U	U	U	U

Legend: P = Preferred D = Desirable U = Undesirable E = Emergency N = Nonconsumed C = Cover

Hydrology Functions: Runoff is rapid on this site due to little infiltration and steep slopes. Runoff soon reaches the drainages below.

Recreational Uses: Hunting, camping, hiking, bird watching, photography, and horseback riding.

Wood Products: Juniper grows in sufficient numbers in some locations to be a source for fence posts.

Other Products: At some locations, caliche is mined and used for road bases. These are open pit mines and are usually relatively small. Once mined, these areas are difficult to re-vegetate economically

Supporting Information:

Associated Sites: Sites that normally occur in proximity to the Breaks Site are: Very Shallow, Limey upland, Loamy, and Hardland sites.

Similar sites: No similar sites.

Inventory Data References: The inventory data is based on long-term observation of well-managed ranges, several years of clipping data, NRCS Range Site Descriptions, numerous historical accounts of vegetation present at time of settlement, and selective literature review (see other references). Numerous range inventories taken over the past 25 years have been reviewed for species composition and production.

State Correlation: Texas and Oklahoma

Type locality: The type localities are located on private property. These type localities are sensitive data.

Relationship to other established classifications:

Other references:

USDA, Natural Resources Conservation Service Range Site Descriptions, HP 77E

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Gould, Charles, Geological Survey of the Eastern Texas Panhandle, 1907.

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Rathjen, Frederick W., The Texas Panhandle Frontier, 1973, Rev. 1998, Univ. of Texas Press

Hatch, Gandhi and Brown, Checklist of the Vascular Plants of Texas, Texas Agri. Exp. Station Publ., Texas A & M Univ. System, 1990.

Costello, David, The Prairie World.

Personal discussions with Dr. Ron Sosebee, Texas Tech Dept of Range, Wildlife & Fisheries.

Site Reviewers:

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Oklahoma State University, Department of Plant and Soil Sciences, Stillwater Oklahoma

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Site Description Approval:

Mark Moseley
State Range Conservationist
Stillwater, Oklahoma

Homer Sanchez
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Temple, Texas

Appendix 1

Ecological Reference Worksheet

Author(s)/participant(s): **J. R. Bell, (Retired NRCS)** **Date:** Sept. 2003

Reference site used? Yes (Presumed Historic Plant Community, Scarp slope, NE exposure)

MLRA: 77E **Ecological Site:** Breaks, R077EY005TX (Formerly R070AY005OK)

Indicators.
1. Number and extent of rills: There are few breaks. The few breaks are small. Rills occur in areas where plant density is least and rock cover is less.
2. Presence of water flow patterns: Few. Water tends to be funneled to points of concentration and taken down slope.
3. Number and height of erosional pedestals or terracettes: Few to some. Bunchgrasses exhibit some pedestaling, but this is natural for this site.
4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are <i>not</i> bare ground): There is 15 to 20% bare ground. Plant cover and litter cover is 50%. Rock cover is 30% or greater. These amounts vary within the site.
5. Number of gullies and erosion associated with gullies: Few gullies. Where major concentrations of water exist, there are some gullies, but these areas are stable and vegetated.
6. Extent of wind scoured, blowouts and/or depositional areas: None.
7. Amount of litter movement (describe size and distance expected to travel): Little movement of litter. After hard rains, litter may move up to .5 meter. The presence of rock cover (fragments greater than 3" in diameter), tends to stabilize both the litter and soil.
8. Soil surface (top few mm) resistance to erosion (stability values are averages – most sites will show a range of values for both plant canopy and interspaces, if different): Resistance is moderate. High percent of rock (caliche) cover aids in surface stability.
9. Soil surface structure and SOM content (include type and strength of structure, and A-horizon color and thickness for both plant canopy and interspaces, if different): Weak aggregates. A horizon is dark brown with thickness of 4 to 8 inches and low SOM (1%).
10. Effect of plant community composition (relative proportion of different functional groups) & spatial distribution on infiltration & runoff: Bunchgrasses, perennial forbs, and shrubs tend to slow runoff and increase infiltration. This reduced runoff and crytogamic crusts help to reduce erosion. Steep slopes are the main factor affecting infiltration and runoff.
11. Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site): None.
12. Functional/Structural Groups (list in order of descending dominance by above-ground weight using symbols: >>, >, = to indicate much greater than, greater than, and equal to): Mid and tall bunchgrasses > shrubs > perennial forbs > crytogamic crusts.
13. Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence): Bunchgrasses show some dead material. 10 to 15% of plants have large amounts of dead material present. This is expected for this site.
14. Average percent litter cover (10 – 15 %) and depth (.2 inches). Where sand and little bluestem are prevalent, the amount of litter and depth is greater.
15. Expected annual production (this is TOTAL above-ground production, not just forage production): 600 - 1200 #/acre. Highly variable. Northeast facing slopes produce more than south and west facing slopes by as much as 100%.
16. Potential invasive (including noxious) species (native and non-native). List species which characterize degraded states and which, after a threshold is crossed, "can, and often do, continue to increase regardless of the management of the site and may eventually dominate the site": None. In certain locations, juniper may dominate.
17. Perennial plant reproductive capability: All species can reproduce.

* This site depicts an excellent plant community and a more mesic exposure.

Rev. 12/15/02